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Laser and electron beam welding: processes and equipment

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Laser Welding

Equipment · Processes

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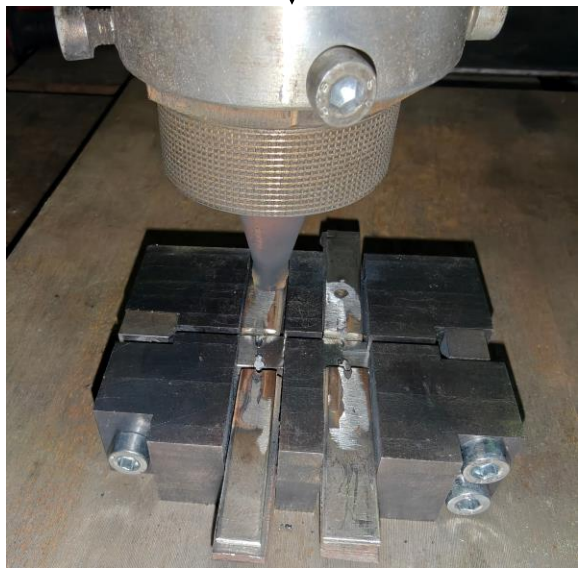
Welding and Cladding

4kW fiber laser
“ROFIN-SINAR DY044”

Welding





Cladding



Various laser equipment

Modern dual-fiber laser system with variable laser power up to 6000 W



Various laser equipment

Large-scale experimental unit





Various laser equipment



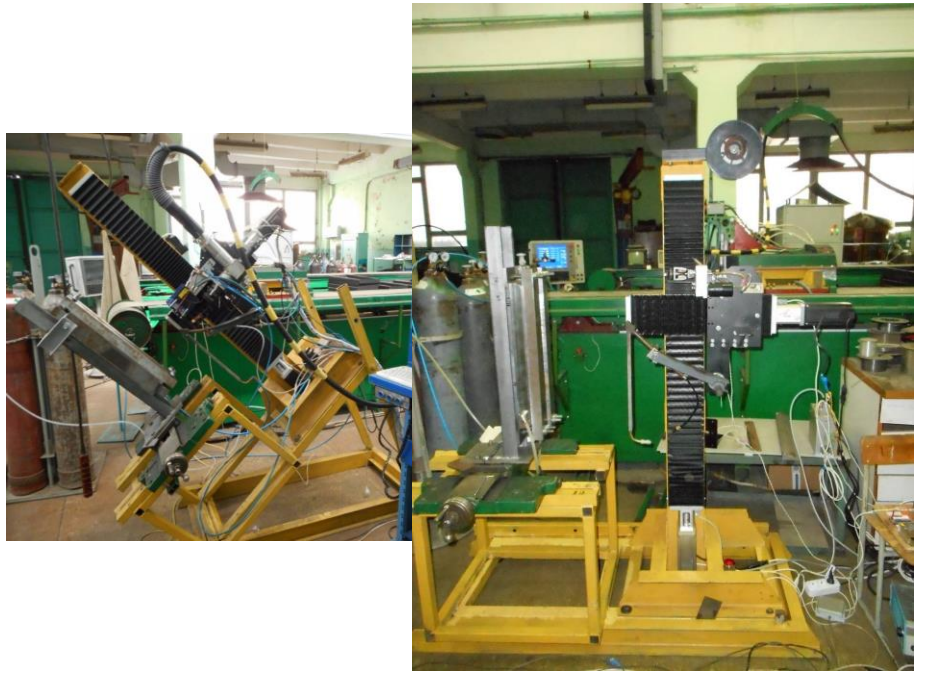


Experimental stands for laser welding

Low-power precision linear laser welding



Laser welding in various spatial positions



Development of handheld tools for laser welding

Welded via handheld laser welding showcasing the amount of complex joints requiring the selected approach



Handheld welding tool





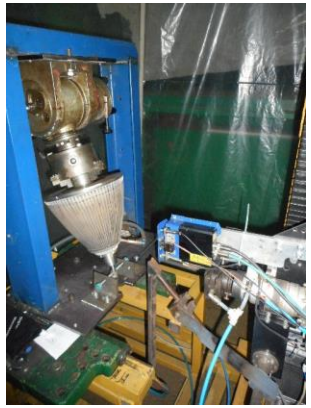
Mobile control system

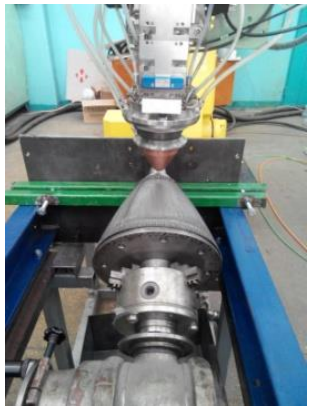


Laser welding and cladding of small nozzle units for liquid-propelled rockets

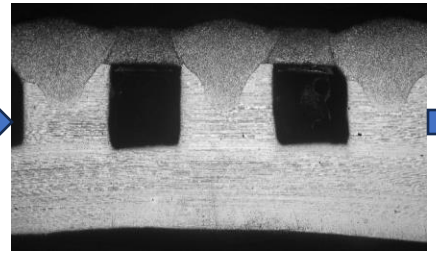
Welding multi-layered construction, repair of defective/damaged rocket engine parts, as well as cladding technologies for creation of technological elements





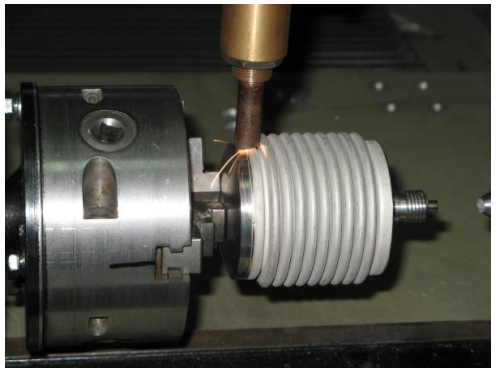




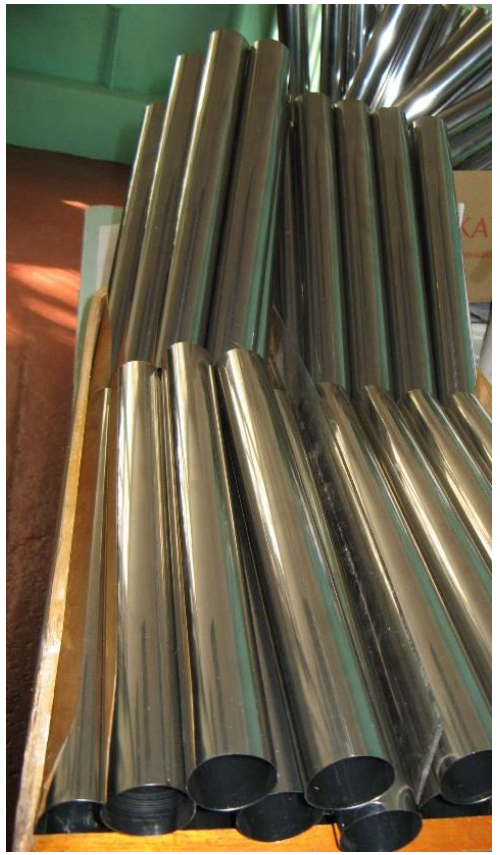




Laser welding of multi-layer metal bellows and bellow compensators





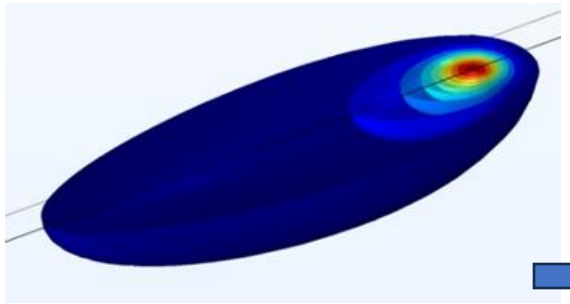


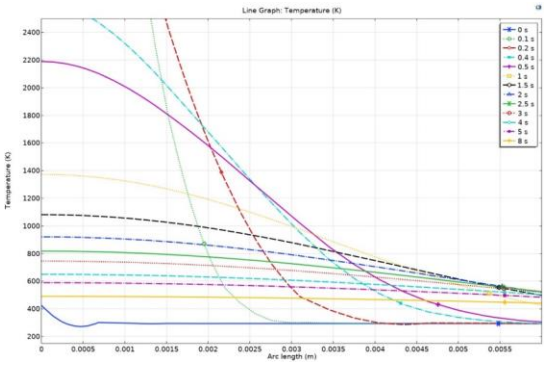




Laser Welding of Multi-Component Hear-Resistant Alloys

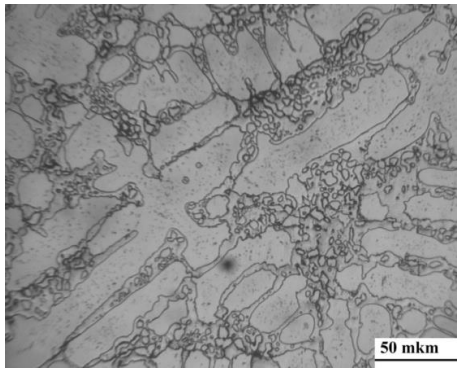
FEM-modelling of the process

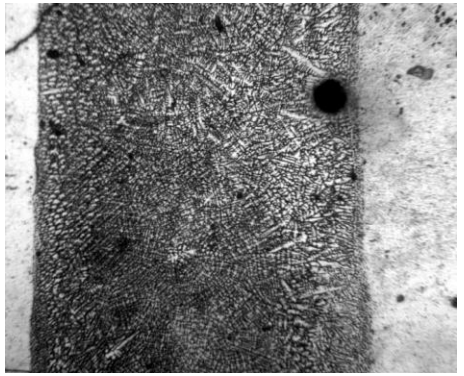




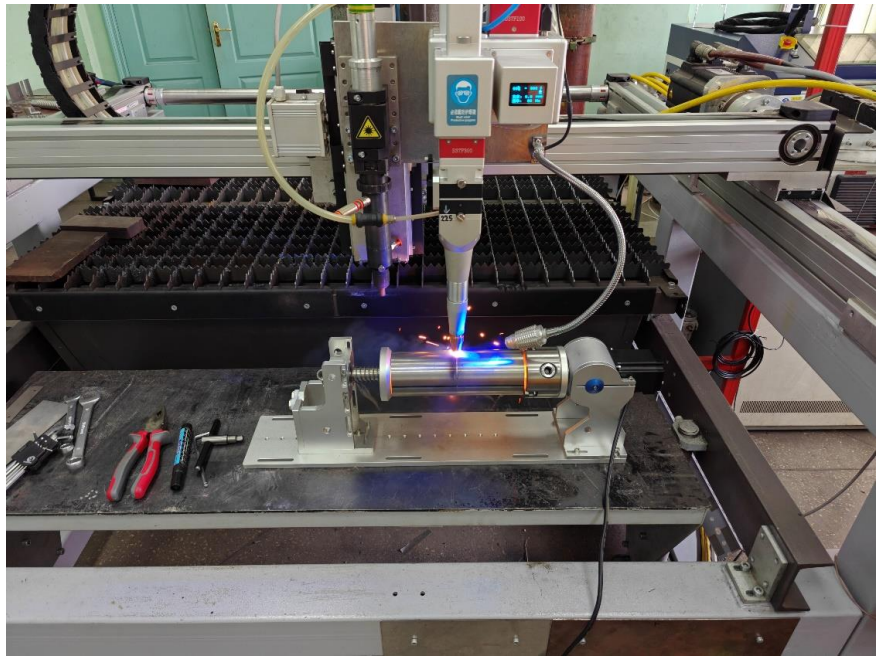


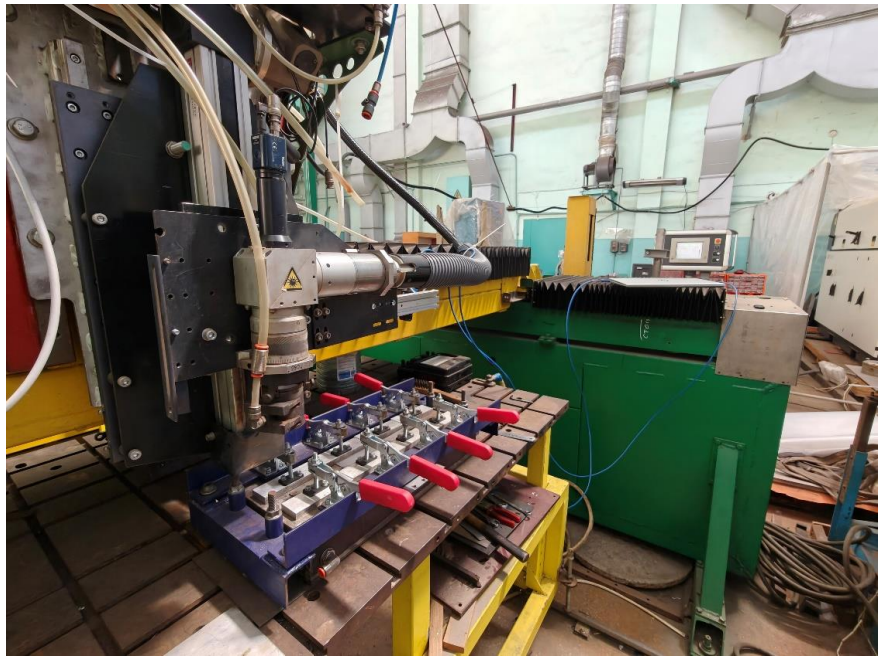
Structural analysis



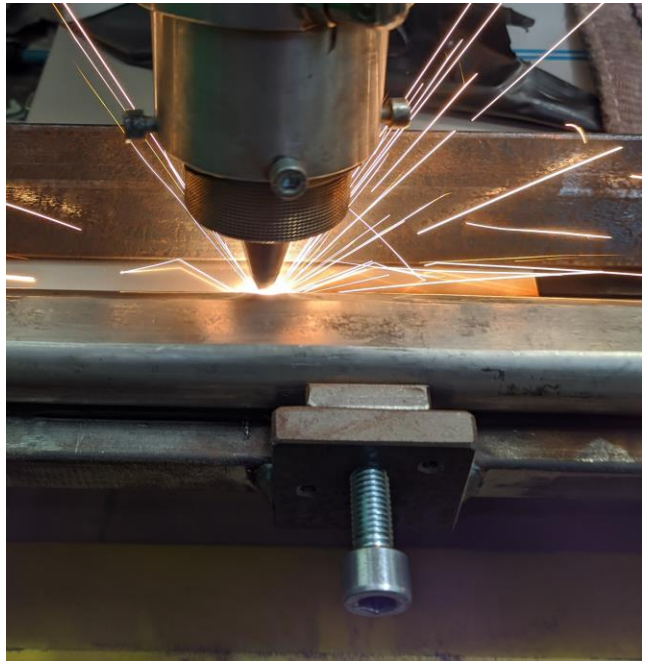


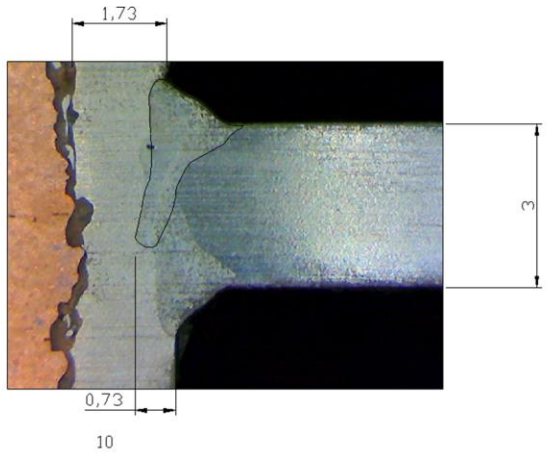
Laser welding of thin-walled steel





Development and manufacturing of cathode matrices via laser welding





Cathode matrices are important parts, required for copper refining via electrolysis.



Laser welding of aviation parts from VT-20 titanium alloy (Ti-Al-Zr-Mo-V)





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Electron Beam Welding

Equipment · Processes

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Wide range of manufactured electron beam machines

Small electron beam welding units (<10m^3)

Medium-size electron beam welding units (10…50m^3)

Large-size electron beam welding units (>50m^3)

EBW for aircraft industry

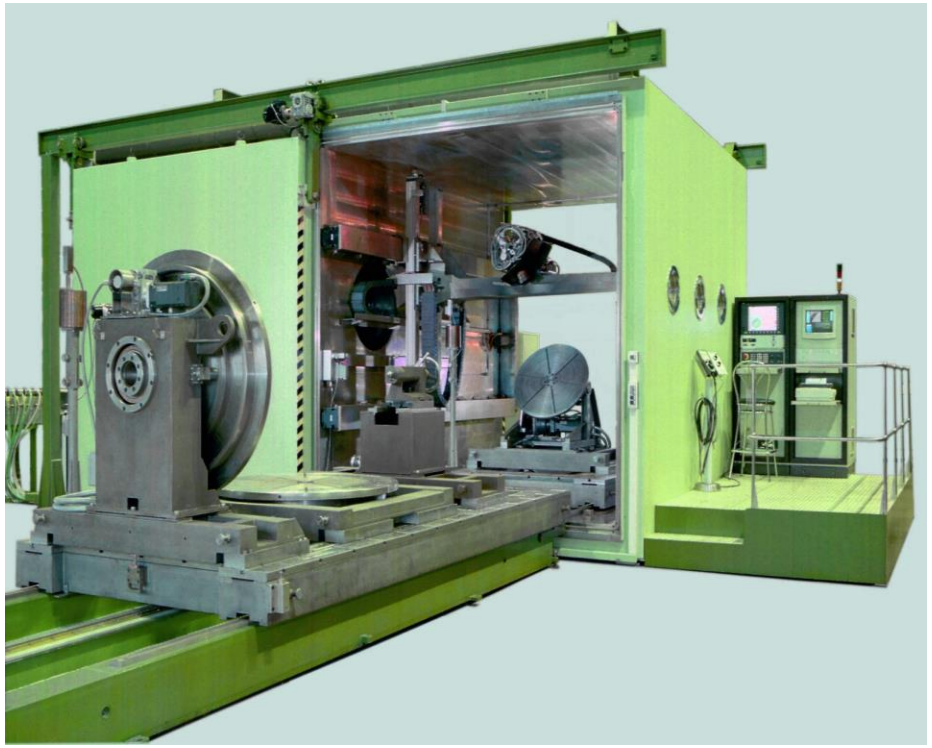
High-voltage power supplies

Special EBW units:

- Drill bits
- Thick-walled slabs
- Granule metallurgy
- 3D technology

Medium-size EBW units with vacuum chambers 10…50 m3

KL115 (GKN Aerospace Chem-tronics Inc., USA)



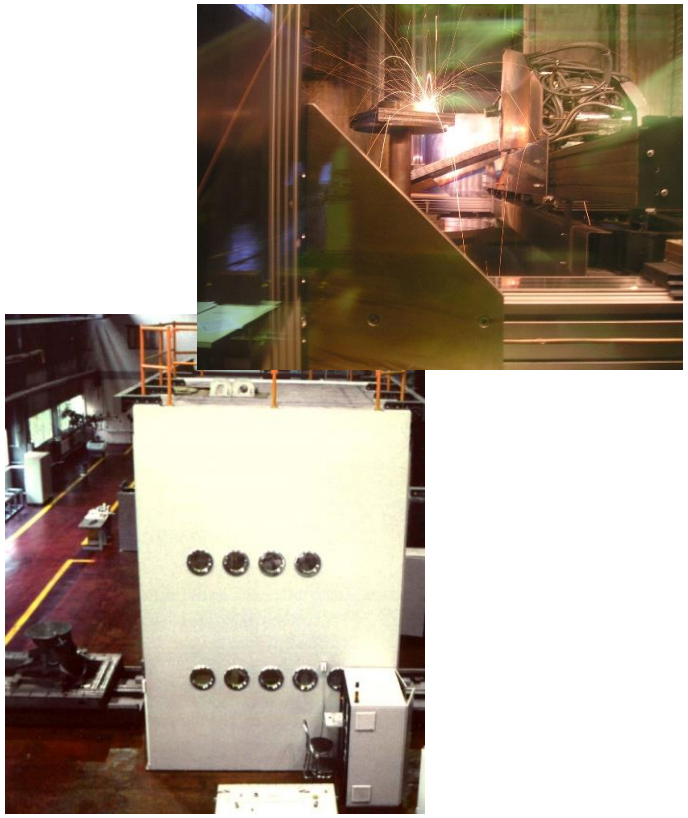




Large-size EBW units with vacuum chambers >50m3

KL-118 (GKN Aerospace Chem-tronics Inc., USA)





Special EBW units granule metallurgy

KL139





Machines for degassing, filling and vibratory compaction of granules in capsules, with electron beam sealing of the capsules

KL114





EBW of large aluminium beams and titanium profiles









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